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## Review - Hecla Mining Company Pilot Plant Study Report on Cyanide and Metal Removal at Grouse Creek

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The Hecla report was reviewed to answer four questions:

1. Are there any obvious flaws in the investigations?
2. Were there any oversights?
3. Is anything missing?
4. Is there any information that could be relevant to the EPA project at the Bunker Hill Mine?

### Question 1 -

The proposed treatment flow sheet has not been tested yet since it is a blend of two different approaches. The proposed flow sheet should be tested. No other obvious flaws were noted during the review.

### Question 2 -

Work on selenium was not carried out at favorable conditions. In streams and samples that had been treated with hydrogen peroxide the selenium would have been oxidized to Se (VI), which is difficult to remove. Methods that are even marginally effective in selectively reducing the selenium concentration have been carried out with reducing agents at pH values of ~3.0 or below. This may not be an oversight, however; it may reflect conscious decision to evaluate treatment under conditions that would be more favorable for final discharge.

### Question 3 -

No data were provided for the concentrations of iron or several other metals in the untreated water samples. No data for anions were reported. This does not (necessarily) affect the value of the report as it applies to Grouse Creek, but it makes it difficult to generalize the information to other sites.

### Question 4 -

The Hecla report does not provide new information that would benefit the Bunker Hill project.

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